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(54) **ATHLETIC APPARATUS WITH NON-LINEAR SLIDING TRACK**

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(57) **ABSTRACT**

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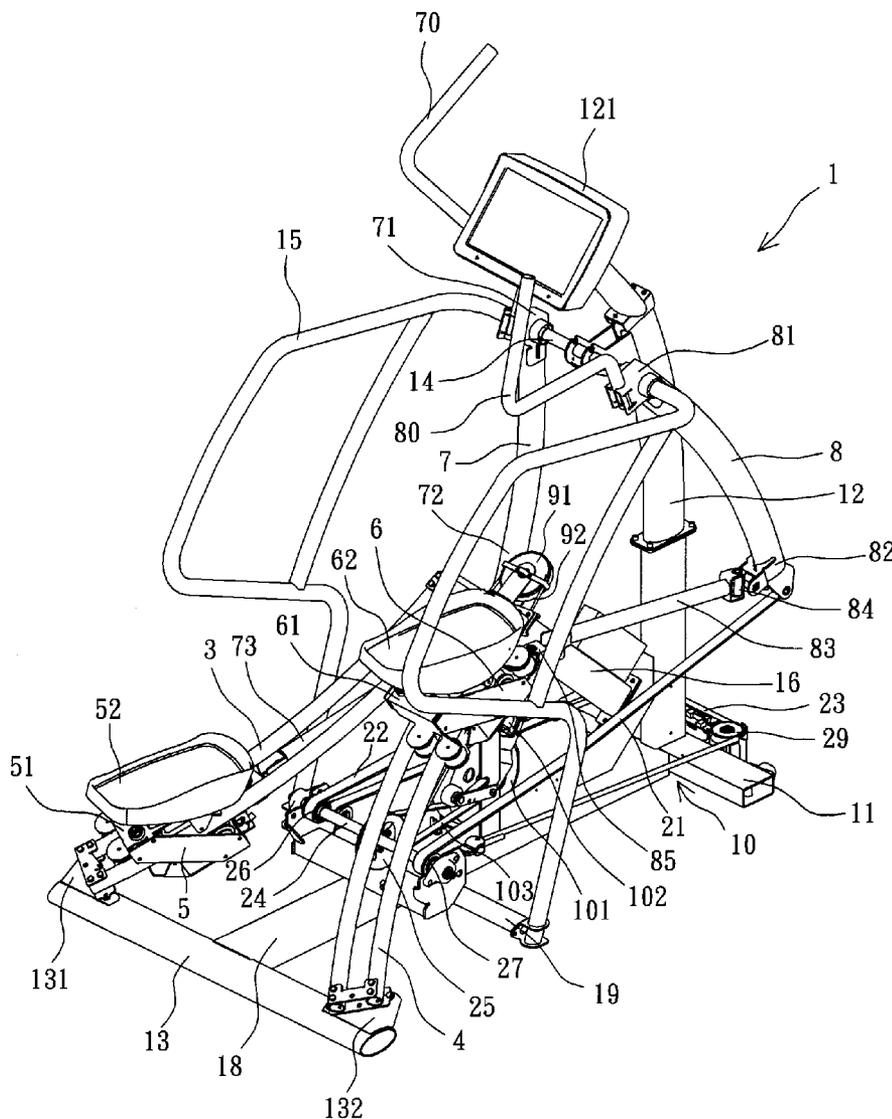
An athletic apparatus with non-linear sliding tracks includes a frame, a pair of tracks installed to the frame, a pair of pedal mechanisms slidably installed to the tracks and a pair of rocker arm mechanisms. Each track is formed by at least one curved pipe. Each rocker arm mechanism pivoted to a shaft rod of the frame is linked to the pedal mechanism through at least one linking rod and further connected to a damping mechanism which provides a resistance to the rocker arm mechanism. Each pedal mechanism is linked to a steel rope of a linking mechanism so that the pair of the pedal mechanisms can move back and forth against each other alternately along the curved tracks. A handle is arranged on a top of each rocker arm mechanism, a user can exercise by holding the handles and treading on the pedal mechanism.

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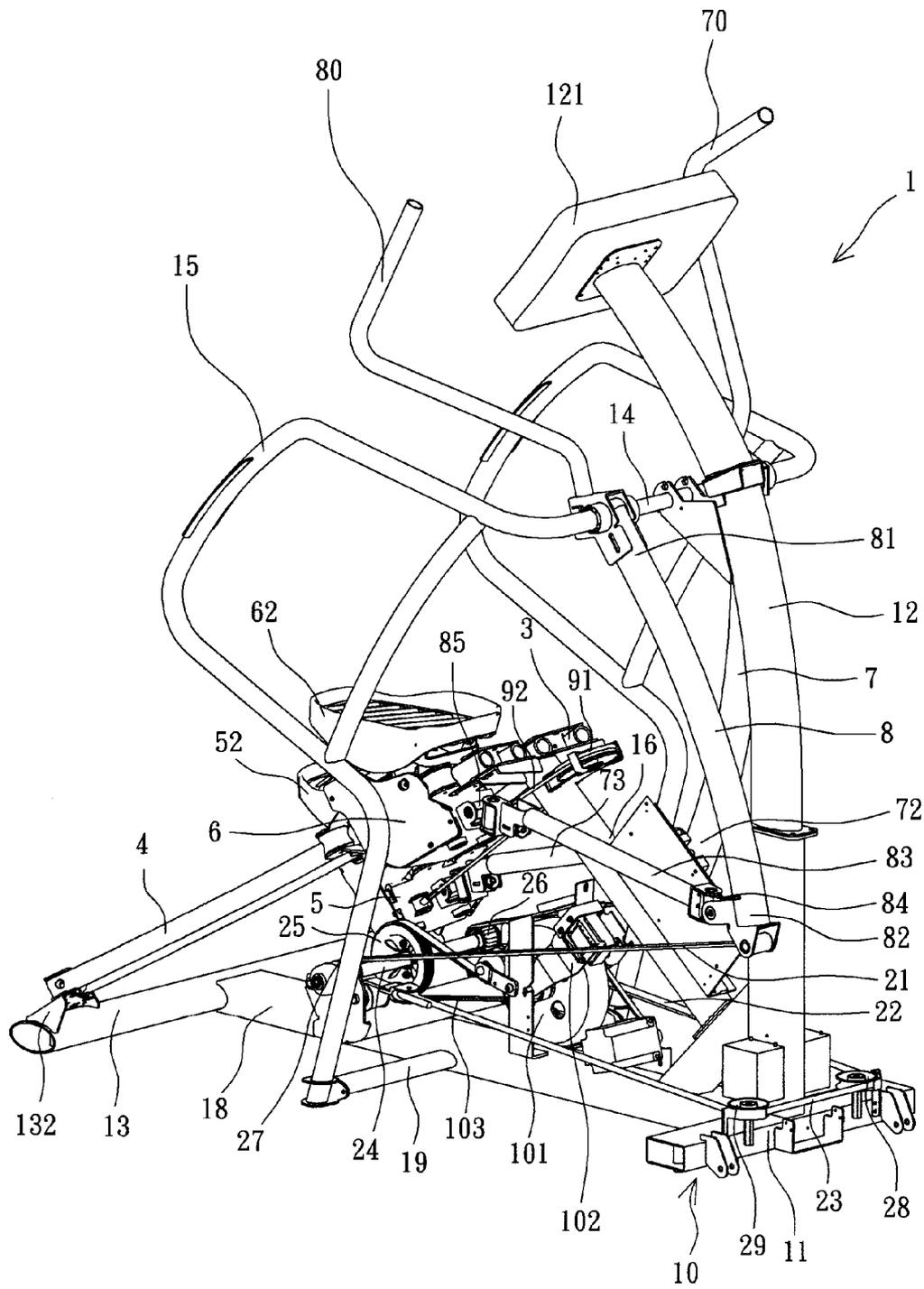


Fig. 1

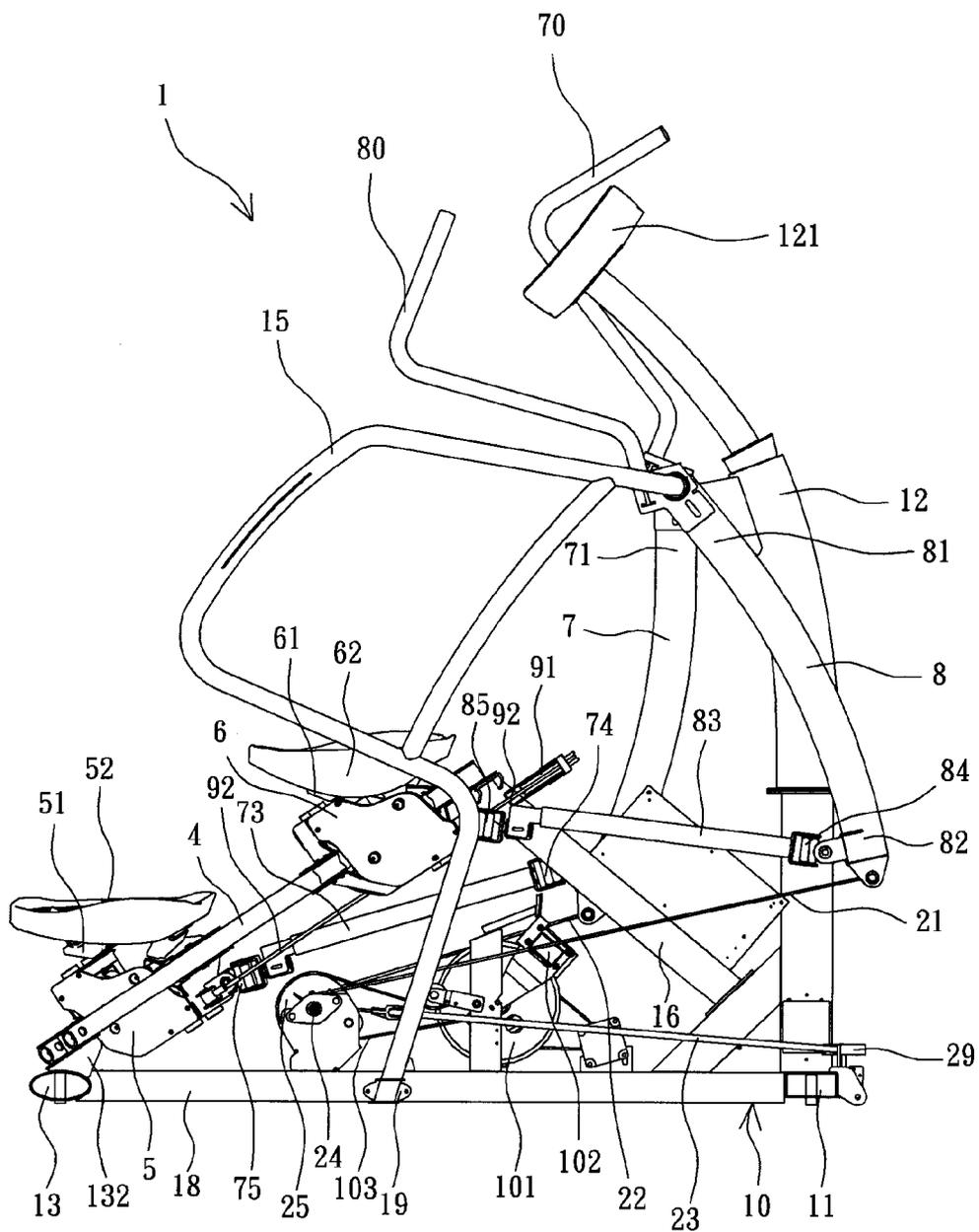


Fig. 2

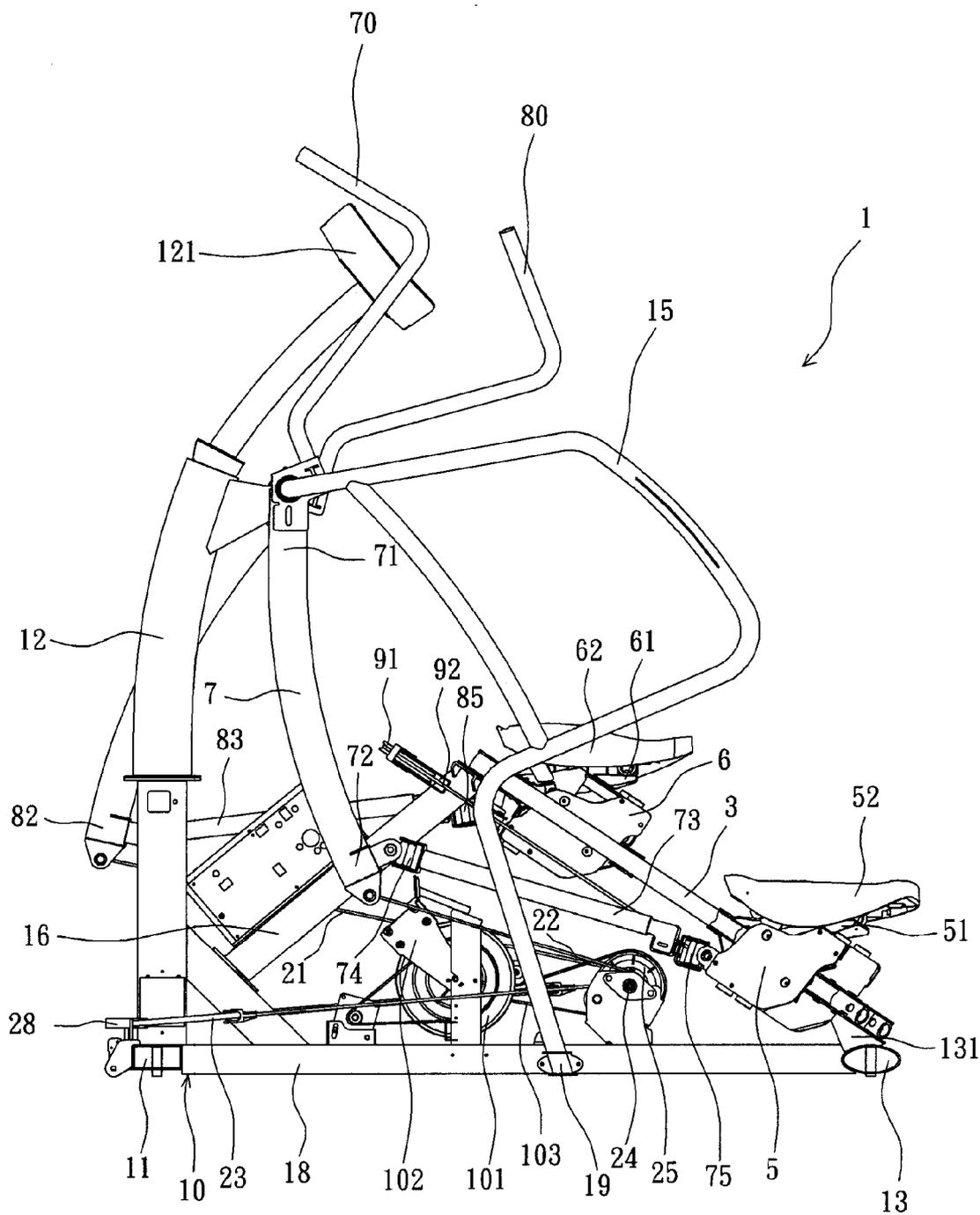


Fig. 3

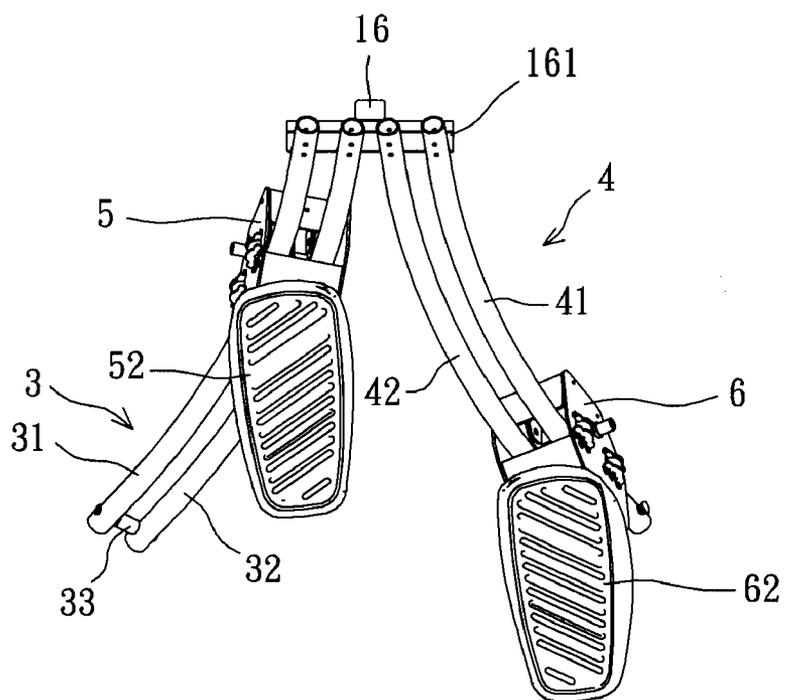


Fig. 4

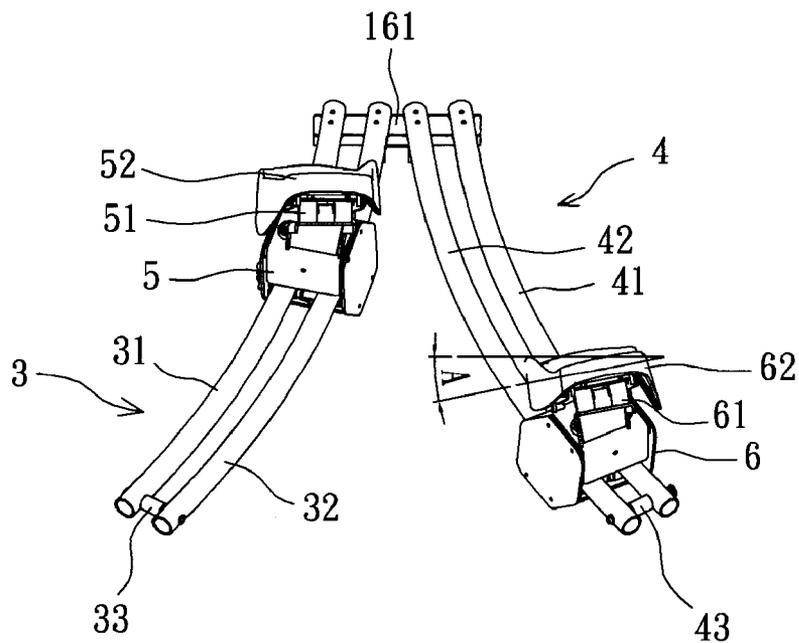


Fig. 5

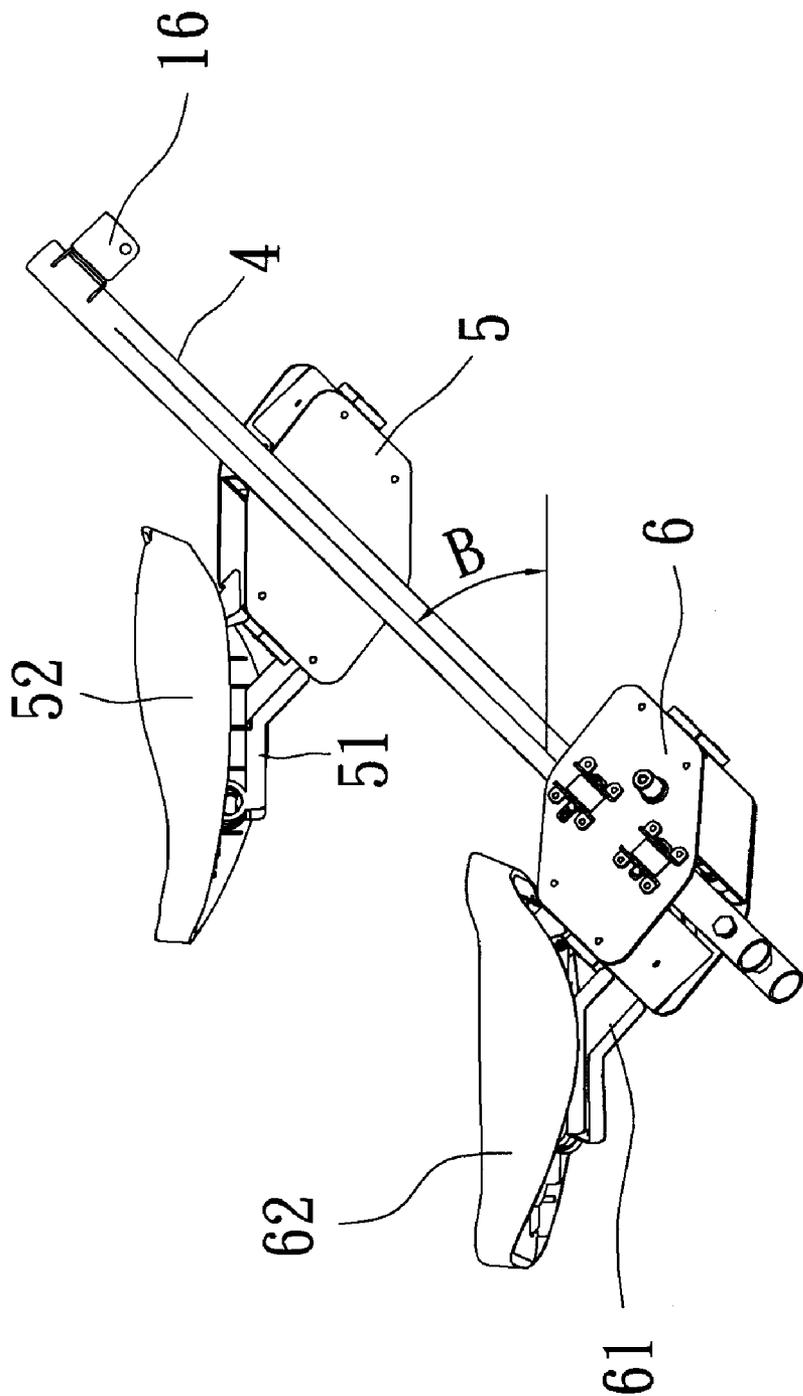


Fig. 6

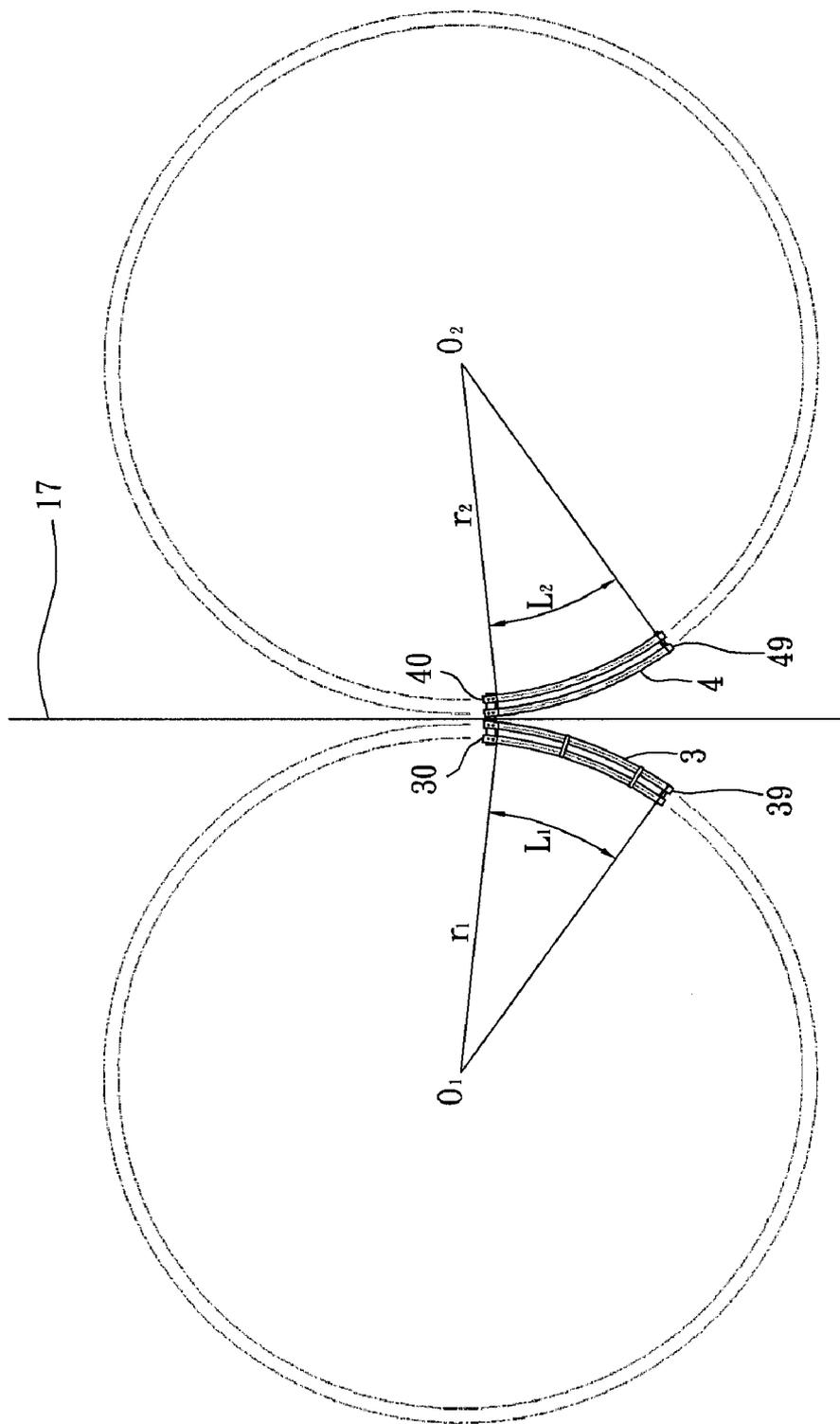


Fig. 7

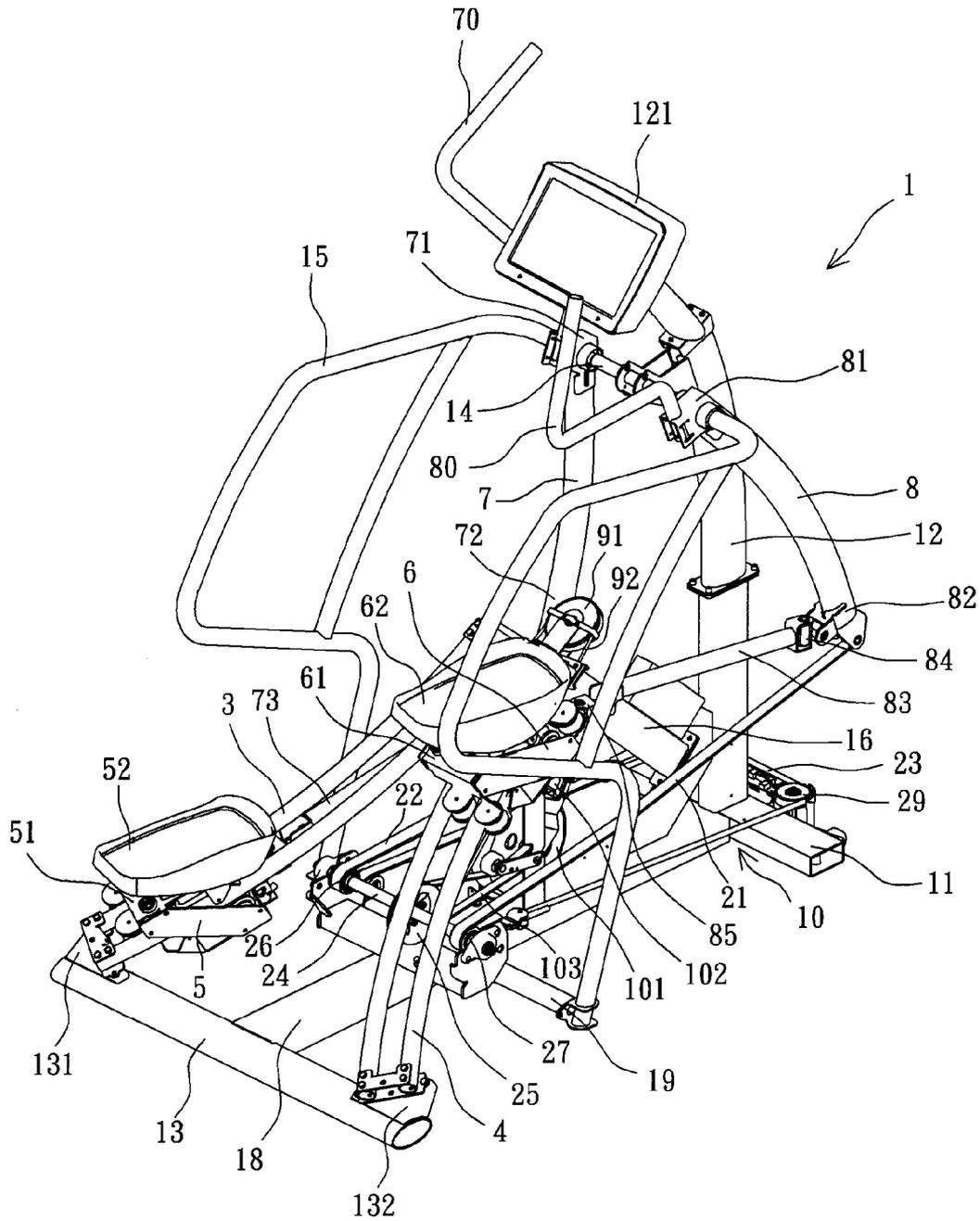


Fig. 8

ATHLETIC APPARATUS WITH NON-LINEAR SLIDING TRACK

FIELD OF THE PRESENT INVENTION

[0001] The present invention relates to athletic apparatus, and particular to an athletic apparatus with a non-linear sliding track and provides complicated exercise for user's hands and feet.

DESCRIPTION OF THE PRIOR ART

[0002] A plenty of athletic apparatus are developed for the purposes of body fitness or rehabilitation. Athletic apparatus such as a stair climber can provide an exercise for a user's feet by treading up and down on pedals only. Athletic apparatus such as an elliptical trainer can provide an exercise for both hands and feet. Pedals of the elliptical trainer fixed to a linking rod can not be moved alone. Although the stair climber and the elliptical trainer are well developed and improved, the exercise style of the stair climber is still an upwards and downwards exercise and the style of the elliptical trainer is still an elliptical movement and the pedals still can not be slid on the supporting linking rod.

SUMMARY OF THE PRESENT INVENTION

[0003] Accordingly, the present invention provides a non-straight track which means an athletic apparatus with curved tracks. The athletic apparatus provides exercise for a user's hands and feet, especially a curved slide of good athletic effect for the user's feet.

[0004] To achieve above object, the present invention provides an athletic apparatus comprising: a frame placed on a level ground; a pair of left and right tracks of the same structure fixed to the frame at a predetermined angle to the ground; the tracks being formed curved but not straight; a pair of left and right pedal mechanisms of the same structure including pedals for treading by a user's feet and being installed to the left and right tracks respectively; the pedal mechanisms further being moved up and down along the curved tracks; a pair of left and right rocker arm mechanisms of the same structure being movably installed to the frame and the left and right pedal mechanisms so as to be moved identically with the pedal mechanisms; wherein by the curved tracks, the users experiences the most natural feet exercise and an ergonomic design capable of protecting user's heels from being hurt.

[0005] The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a pictorial drawing of an embodiment of an athletic apparatus of the present invention.

[0007] FIG. 2 is a pictorial drawing of the embodiment of the present invention viewing from a side.

[0008] FIG. 3 is a pictorial drawing of the embodiment of the present invention viewing from another side to the FIG. 2.

[0009] FIG. 4 is a top view showing pedal mechanisms at a back and front positions of tracks.

[0010] FIG. 5 is a front view showing the pedal mechanisms at the back and front positions of the tracks.

[0011] FIG. 6 shows drawing of the FIG. 5 from a side.

[0012] FIG. 7 shows the curved tracks oppositely installed to a center line.

[0013] FIG. 8 is a pictorial drawing of the athletic apparatus viewing from a back side.

DETAILED DESCRIPTION OF THE INVENTION

[0014] In order that those skilled in the art can further understand the present invention, a description will be provided in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope and spirit of the present invention defined in the appended claims.

[0015] With reference to FIGS. 1, 2, 3, and 8, an athletic apparatus 1 according to the present invention is illustrated. The athletic apparatus 1 includes a frame 10, a pair of separated tracks 3 and 4, a pair of pedal mechanisms, a pair of separated rocker arm mechanisms, two transmitting mechanisms, and a damping mechanism.

[0016] The frame 10 has a base 18 which includes a front bottom rod 11 and a rear bottom rod 13 separated from each other. The front bottom rod 11 is formed as a standing rod 12, a control panel 121 is installed to a top of the standing rod 12. The users can operate the athletic apparatus 1 through the control panel 121. An axle rod 14 is formed near an upper end of the standing rod 12, handles 15 for holding by the users are formed respectively between two ends of the axle rod 14 and a middle bottom rod 19 of the base 18. Installation portions 131 and 132 are formed separately to the rear bottom rod 13.

[0017] The tracks 3 and 4 of the same structure are arranged to a left and right side of the athletic apparatus 1 respectively. Bottom ends of track 3 and 4 are fixed to the installation portions 131 and 132 respectively, while upper ends of the tracks 3 and 4 are fixed to an inclined supporting rod 16 of the frame 10 so that the left and right tracks are at a predetermined angle to the ground. A main characteristic of the tracks is that the tracks are made as curved but not straight. The design of the tracks will have the users experienced the most natural exercise for feet, it is also an ergonomic design capable of protecting user's heels from being hurt.

[0018] The left and right pedal mechanisms of the same structure have pedal bases 5 and 6, supporters 51 and 61 linked to the pedal bases 5 and 6, and pedals 52 and 62 for treading by the users respectively. The pedal bases 5 and 6 are slidably installed to the inclined tracks 3 and 4 respectively and capable of being slid up and down along the tracks.

[0019] The left and right rocker arm mechanisms of the same structure have rocker arms 7 and 8 respectively. Upper ends 71 and 81 of the rocker arms 7 and 8 respectively are pivoted to the axle rod 14, and handles 70 and 80 are arranged to the rocker arms 7 and 8 respectively for holding by the users. Lower ends 72 and 82 of the rocker arms 7 and 8 are pivoted to linking rods 73 and 83 through universal connectors 74 and 84 (which are capable of rotating in Y and Z axes) respectively. Another ends of the linking rods 73 and 83 are also pivoted to the pedal bases 5 and 6 through universal connectors 75 and 85. Therefore, the left and right rocker arm mechanisms and the left and right pedal mechanisms can be moved identically.

[0020] A first transmitting mechanism is rotatably installed to the inclined supporting rod 16 near to a pulley 91 below the upper ends of the tracks 3 and 4 and a steel rope 92 wound the pulley 91. Two ends of the steel rope 92 are connected to the

left and right pedal bases **5** and **6** respectively so that the pedal bases **5** and **6** can be slid back and forth, up and down against each other alternately.

[0021] Referring to FIGS. **1** to **3**, a second transmitting mechanism is illustrated. The second transmitting mechanism has two timing belts **21**, **22** and an elastic belt **23** linking the two timing belts **21**, **22**. Outer ends of the timing belts **21**, **22** are connected to the lower ends **72**, **82** of the rocker arms **7** and **8** respectively so that the left and right rocker arm mechanisms can be swung back and forth alternately with an axle center of the axle rod **14**. A shaft rod **24** is installed to the frame **10**. A belt wheel **25** is installed to a middle position of the shaft rod **24**, and two gear wheels **26**, **27** are installed to two ends of the shaft rod **24**. The gear wheels **26**, **27** have single direction bearing. The timing belts **21**, **22** clench the teeth of the gear wheels **26** and **27** respectively. Two wheels **28**, **29** are pivoted to two ends of the front bottom rod **11**. The elastic belt **23** linking the timing belts **21**, **22** also winds the wheels **28** and **29**. By the second transmitting mechanism, the left and right rocker arms **7** and **8** can be moved back and forth against each other alternately.

[0022] The damping mechanism includes a load wheel **101** and an electro-magnetic brake **102**. By the link of a transmitting belt **103**, the load wheel **101** is linked to the belt wheel **25**. When the handles **70** and **80** are swung back and forth alternately, the damping mechanism can provide a resistance. The resistance can be pre-selected on the control panel **121**.

[0023] With reference to FIGS. **4** to **6**, the main characteristic of the left and right tracks **3** and **4** is made of at least one curved track. The tracks **3** and **4** of the embodiment of the present invention are made of two parallel curved pipes **31**, **32** and **41**, **42** and combined by linking bodies **33**, **43** respectively. The upper ends of the curved pipes are all fixed to a common linking unit **161** which is fixed to an upper end of the inclined supporting rod **16**. The linking bodies **33** and **43** and the lower ends of the tracks are fixed to the installation portions **131** and **132** so that the tracks are installed to the frame **10** at an angle **B** to the ground as shown in FIG. **6**.

[0024] Referring to FIG. **7**, a center line **17** illustrated between the oppositely installed tracks **3** and **4** indicates a longitudinal direction of the base **18** of the present invention. A first track, which is the left track **3** is an arc of a length **L1** based on a virtual radius **r1** and a center of circuit **O1**. The second track **4** is an arc of a length **L2** based on a virtual radius **r2** and a center of circuit **O2**. The radii and lengths of the arcs of the two tracks **3** and **4** are equal. The two curved tracks installed between the rear bottom rod **13** and the inclined supporting rod **16** are gradually away from each other from the upper ends to the lower ends thereof. That is, the upper ends **30** and **40** of the tracks **3** and **4** are near to the center line **17** and the lower ends **39** and **49** of the tracks **3** and **4** are away from the center line **17** so that the concaves of the arcs of the tracks face outwards respectively.

[0025] When operating the athletic apparatus **1** according to the present invention, a user (not illustrated) stands on the pedals **52** and **62** with both feet respectively and holds the handles **70** and **80** with both hands respectively. While the user overcomes the resistance of the load wheel **101**, the rocker arm mechanisms are pulled back and forth and the pedals mechanisms are moved back and forth, up and down against each other alternately in the same time.

[0026] The athletic apparatus **1** according to the present invention can provide a composite body exercise for hands and feet of the users. Also, by the design of the curved tracks

3 and **4**, the pedals bases **5** and **6** will be moved along the curved tracks so that feet of the user can exercise smoothly by moving outwards and downwards together and moving forth and upwards together.

[0027] The pedals **52** and **62** are parallel to the ground on the tracks **3** and **4** at a static status. For the balance of the users operating the athletic apparatus **1**, as shown in FIG. **5**, the pedals **52** and **62** can tilt towards each other with a small angle **A** so that the upwards and downwards movement along the arcs are smooth and safe.

[0028] The athletic apparatus **1** according to the present invention has a simple structure and provides a physical training on muscles of user's arms and feet. Especially to the design of the tracks **3** and **4**, the users can exercise inwards and outwards curved slides. Moreover, the rocker arm mechanisms can drive the load wheel **101** through the belt wheel **25** by the link of two timing belts on the same axis to the belt wheel **25**. On the other hand, the rocker arm mechanisms can drive the corresponding pedal mechanisms on the left and right tracks **3**, **4** synchronously by the link of linking rods **73** and **83** so that the athletic apparatus **1** can archive an anticipated purpose and effect.

[0029] The present invention is thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

1. An athletic apparatus comprising:
 - a frame (**10**) placed on a level ground;
 - a pair of left and right tracks (**3**; **4**) having the same structure and fixed to the frame (**10**) at a predetermined angle to the ground; the tracks (**3**, **4**) being formed curved but not straight;
 - a pair of left and right pedal mechanisms having the same structure and including pedals (**52**; **62**) for being treaded by a user's feet and being installed to the left and right tracks (**3**; **4**) respectively; each pedal mechanisms further being moved up and down along the curved tracks (**3**, **4**);
 - a pair of left and right rocker arm mechanisms having the same structure and being movably installed to the frame (**10**) and the left and right pedal mechanisms so as to be moved with respect to the pedal mechanisms;
 - a first transmitting mechanism installed to an inclined supporting rod (**16**) of said frame (**10**), and connecting to said left and right pedal bases (**5**, **6**) for sliding back and forth, up and down along said left and right tracks (**3**; **4**); wherein by the curved tracks (**3**, **4**), the users experience the most natural feet exercise and an ergonomic design capable of protecting user's heels from being hurt is provided; and
 - wherein the pedal bases (**5**) and (**6**) are moved along the curved tracks (**3**; **4**) so that the feet of the user can exercise smoothly by moving outwards and downwards together and moving forth and upwards together.

2. The athletic apparatus as claimed in claim **1**, wherein the frame has a base (**18**) which includes a front bottom rod (**11**) and a rear bottom rod (**13**) separated from each other; a standing rod (**12**) is extended upwards from the front bottom rod (**11**), a control panel (**121**) is installed to a top of the standing rod (**12**); the users can operate the athletic apparatus through the control panel; an axle rod (**14**) is approximately vertical to an upper end of the standing rod (**12**), each of two

handles (15) holdable by the user's hands is formed between a respective one of two ends of the axle rod (14) and a respective one of two ends of a middle bottom rod of the base; and two installation portions (131, 132) are formed at two distal ends of the rear bottom rod, respectively.

3. The athletic apparatus as claimed in claim 2, wherein the left and right rocker arm mechanisms have rocker arms (7, 8) with upper ends thereof pivoted to the axle rod (14), and handles (15) arranged to the rocker arms respectively for being held by the user; lower ends of the rocker arms are pivoted to linking rods through universal connectors respectively; another ends of the linking rods are pivoted to the left and right pedal mechanisms through universal connectors.

4. The athletic apparatus as claimed in claim 1, wherein the left and right pedal mechanisms have pedal bases (5, 6), supporters (51, 61) installed on the pedal bases (5, 6), and pedals (52, 62) for being treaded by the user's feet respectively; the pedal bases are slidably installed to the curved tracks respectively and capable of being slid up and down along the tracks.

5. The athletic apparatus as claimed in claim 1, wherein bottom ends of the tracks (5, 6) are fixed to the installation portions (131, 132) of the rear bottom rods respectively, while upper ends of the tracks (5, 6) are fixed to an inclined supporting rod (16) of the frame (10) so that the left and right tracks are at an predetermined angle to the ground.

6. The athletic apparatus as claimed in claim 1, wherein a first transmitting mechanism is rotatably installed to the inclined supporting rod (16) near to a pulley (91) below the upper ends of the tracks (5, 6); and a steel rope (92) winds around the pulley (91); two ends of the steel rope (92) are connected to the left and right pedals (5, 6) respectively so that the pedals are swingable.

7. The athletic apparatus as claimed in claim 6, wherein a second transmitting mechanism has two timing belts (21, 22) and an elastic belt (23) linking the two timing belts (21, 22); outer ends of the timing belts are connected to the lower ends of the rocker arms (7, 8) respectively so that the left and right rocker arm mechanisms is swingable with an axle center of

the axle rod (14); a shaft rod (24) is installed to the frame; a belt wheel is installed to a middle position of the shaft rod; and two gear wheels are installed to two ends of the shaft rod; the gear wheels have an unidirectional bearing; the timing belts clench the teeth of the gear wheels respectively; two wheels are pivoted to two ends of the front bottom rod, and the elastic belt linking the timing belts winds the wheels; by the linking of the second transmitting mechanism, the left and right rocker arm mechanisms is movable against each other alternately.

8. The athletic apparatus as claimed in claim 7, wherein a damping mechanism is installed to the frame; the damping mechanism includes a load wheel and an electro-magnetic brake; by the link of a transmitting belt, the load wheel is linked to the belt wheel.

9. The athletic apparatus as claimed in claim 1, wherein each of the left and right tracks is made by combining two curved pipes of the same radian.

10. The athletic apparatus as claimed in claim 2, wherein a center line of a longitudinal direction of the base is defined as a center line; and the left and right tracks are oppositely installed beside the center line; a first track, that is the left track, is an arc of a length L1 with a virtual radius r1 and a center of circuit O1; a second track, that is the right track, is an arc of a length L2 with on a virtual radius r2 and a center of circuit O2; the radii and lengths of the arcs of the two tracks are equal; the two curved tracks installed between the rear bottom rod and the inclined supporting rod are gradually away from each other from the upper ends to the lower ends thereof; that is, the upper ends of the tracks are near to the center line and the lower ends of the tracks are away from the center line so that the concaves of arcs of the tracks face outwards respectively.

11. The athletic apparatus as claimed in claim 1, wherein at a static status, the pedals on the tracks are parallel to the ground; the pedals are capable of tilting towards one another with a predetermined angle so that the upward and downward movements of the pedals along the arcs are smooth and safe.

* * * * *